RE Future

Swansons Lane Wind Farm

Application for Planning Permit

Appendix J – Fire Risk Assessment

May 2025

Swansons Lane Wind Farm

Risk Management Plan (including Fire Safety Study)

January 2024

FIRE RISK Consultants

Cover photo –View of the typical landscape surrounding the proposed Swansons Lane Wind Farm (Fire Risk Consultants)

Document history and date

Revision	Date	Description	By	Review	Approved
V1 - DRAFT	7/3/2023	Initial draft following assessment of available information and site visit.	M Potter & FRC Project Team	FRC Review Team	G Taylor Managing Director
V2.1 - Final	17/1/2024	Updated following client feedback.	M Potter & FRC Project Team	FRC Review Team	G Taylor Managing Director

Fire Risk Consultants
PO Box 12, Glengarry VIC 3854
0487 790 287
www.fireriskconsultants.com.au

Disclaimer and Information Statement

This report is issued by Fire Risk Consultants Pty Ltd and the information in this report is current as at the date of publication. Any Bushfire Emergency Plan or Bushfire Response Plan is current only at the date of issue as it is up to you to maintain the Australian Standard AS3959:2018 (or equivalent) and AS3745:2018 (or equivalent) for the property and/or building. Failure to maintain the property and/or building to these standards may compromise an insurance policy if currently covering any of your assets or those of any third party that may be consequentially affected due such failure. If not insured, and if you are seeking insurance, this report may not influence the decision of any insurer not to offer cover. To the extent permitted by law, Fire Risk Consultants Pty Ltd will not be held liable for any claims, demands, costs or expenses for any personal injury, property damage or death arising out of failure by you to maintain the property and/or building to AS3959:2018 (or equivalent) and AS3745:2018 (or equivalent).

The information and/or the recommendations contained in this report have been compiled and based on the information, records, data and any other sources of information supplied by you. Whilst we have exercised all due care and skill in compiling the report, you should confirm the accuracy and reliability of the information and material we have relied upon in producing the report. The information contained in the report is confidential and you should only read, disclose, re-transmit, copy, distribute or act in reliance on the information as you are authorised to do so. This report may also contain information, systems or data which is the property of Fire Risk Consultants Pty Ltd and Fire Risk Consultants Pty Ltd has in no way waived or altered in any way its ownership right, or provided consent for use by the report recipient, unless expressly provided in the report.

Any fire safety work, including but not limited to planned burning, back burning and/or fire suppression, on any property or building is specifically excluded from this report.

*Where the term **"Bushfire prevention and mitigation related activities"** (or words to that effect) are used, this is to be defined as the clearance of vegetation in accordance with the Victorian State Government guidelines, including clearing and maintenance of existing fire breaks and/or fire access for fire fighters under electricity pylons and properties that have been constructed to Australian Standard AS3959 and/or the National Construction Code.*

Contents

1 Executive Summary

The Swansons Lane Wind Farm proposes to develop a Wind Energy Facility to the north of Garvoc in south west Victoria. To assess the risk of fire, this Risk Management Plan has been developed to consider fire risk associated with bushfire and a fire starting within the infrastructure.

This Risk Management Plan follows the guidance provided by CFA in their *Design Guidelines and Model Requirements: Renewable Energy Facilities 2023.* It also includes the assessment of bushfire risk in accordance with Clause 13.02 of the Corangamite Planning Scheme.

The assessment of bushfire risk has identified a landscape that has been impacted by bushfires in both 1983 and 2018. These bushfires occurred under elevated fire danger conditions and resulted in bushfires travelling long distances under a north westerly influence. The 1983 bushfire was then influenced by a strong south westerly wind change that saw the fire increase in size considerably. The Clause 13.02 assessment has provided a range of mitigation treatments that aligns with the CFA Guideline.

The proposed development is spread across the Moyne and Corangamite Shire Council areas with three towers in the Corangamite Shire and two towers in Moyne Shire.

The assessment of fire risk within the Wind Energy Facility including the nacelle, substation and office compound identifies the low risk associated with these types of developments. This situation in addition to the mitigation treatments outlined within the CFA Guideline ensures a high level of fire safety in a Wind Energy Facility.

The outcome of the risk assessment has recommended a range of mitigations to manage fire risk including:

- Installation of four static water supply tanks of a minimum of 45,000 litres each spread across the development and complies with AS2419.
- Provision of fire breaks around the base of the wind turbines and the substation and site office area.
- Installation of smoke detection and fire suppression systems within the nacelle.
- Provision of access roads including overtaking bays for the development.
- Ongoing maintenance programs for the life of the project in accordance with the relevant Standards or manufacturer specifications.

The outcome of the risk assessment has indicated that the development can occur in this landscape and not increase the risk of fire to the surrounding community or other infrastructure.

2 Introduction

Fire Risk Consultants have been engaged by RE Future to develop a Risk Management Plan (RMP) for the proposed Swansons Lane Wind Farm located to the north of Garvoc. The Swansons Lane Wind Farm development will result in five wind turbine generators scattered across an area between Princes Highway and Coyles Road to the north.

The site is located approximately six kilometres south west of Terang and 30 kilometres to the north east of Warrnambool. The development is occurring in farming properties. The landscape is primarily grassland associated with paddocks for both stock grazing and crop growing. To the east and north of the development are areas utilised for plantations.

This RMP is required to achieve compliance with the CFA Guideline - *Design Guidelines and Model Requirements: Renewable Energy Facilities 2022* (CFA Guideline). The CFA Guideline outlines the purpose and need for a Risk Management Plan (RMP). The RMP has been developed to provide sufficient information for CFA to make an informed decision. It is expected for the Planning Permit to require a Fire Management Plan (FMP) and Emergency Management Plan (EMP) as per the requirements of the CFA Guidelines.

The RMP has been prepared following an assessment of the site and analysis of supplied information from the client in relation to the design, commissioning and operation of a Wind Energy Facility. As per the CFA Guideline, this report also aligns with NSW Planning's *Hazardous Industry Planning Advisory Paper 2: Fire Safety Study Guidelines (2011)*. The various requirements outlined within the Advisory Paper have been included within this report where it relates to the proposal.

3 Project Overview

This development includes a Wind Energy Facility (WEF) that when completed will have a capacity of approximately 40MW.

When completed the project will include:

- A WEF of five wind turbine generators.
- Underground cables between the turbines and the substation.
- Site Office area.
- Substation.
- Access roads providing connections from the existing Public Roads and the turbine towers.
- Static water supplies for firefighting purposes.
- Asset Protection Zones around the towers and substation area.
- Detection and suppression systems installed within the Nacelle.

4 Existing conditions assessment

4.1 Site description and location

The Wind Energy Facility is spread over approximately 6.5 km² and is located to the south west of Terang and to the north of Garvoc. The project involves the construction, commissioning and operation of five wind turbine generators (see Figure 1) and associated infrastructure including a substation and works/office compound.

The development occurs to the north of Princes Highway, to the south of Coyles Road and east of Sisters-Garvoc Road. Princes Highway is a major thoroughfare between Geelong and Warrnambool. The development is to the north west of the Garvoc township.

The location of the wind turbines is within grassland areas that are associated with farming activities. To the north and east of the development are plantations. The Geelong to Warrnambool train line travels along the eastern and southern boundary of the development.

The surrounding landscape is consistent with the development site. The entire area is dominated by farming properties that consist of stock grazing and cropping.

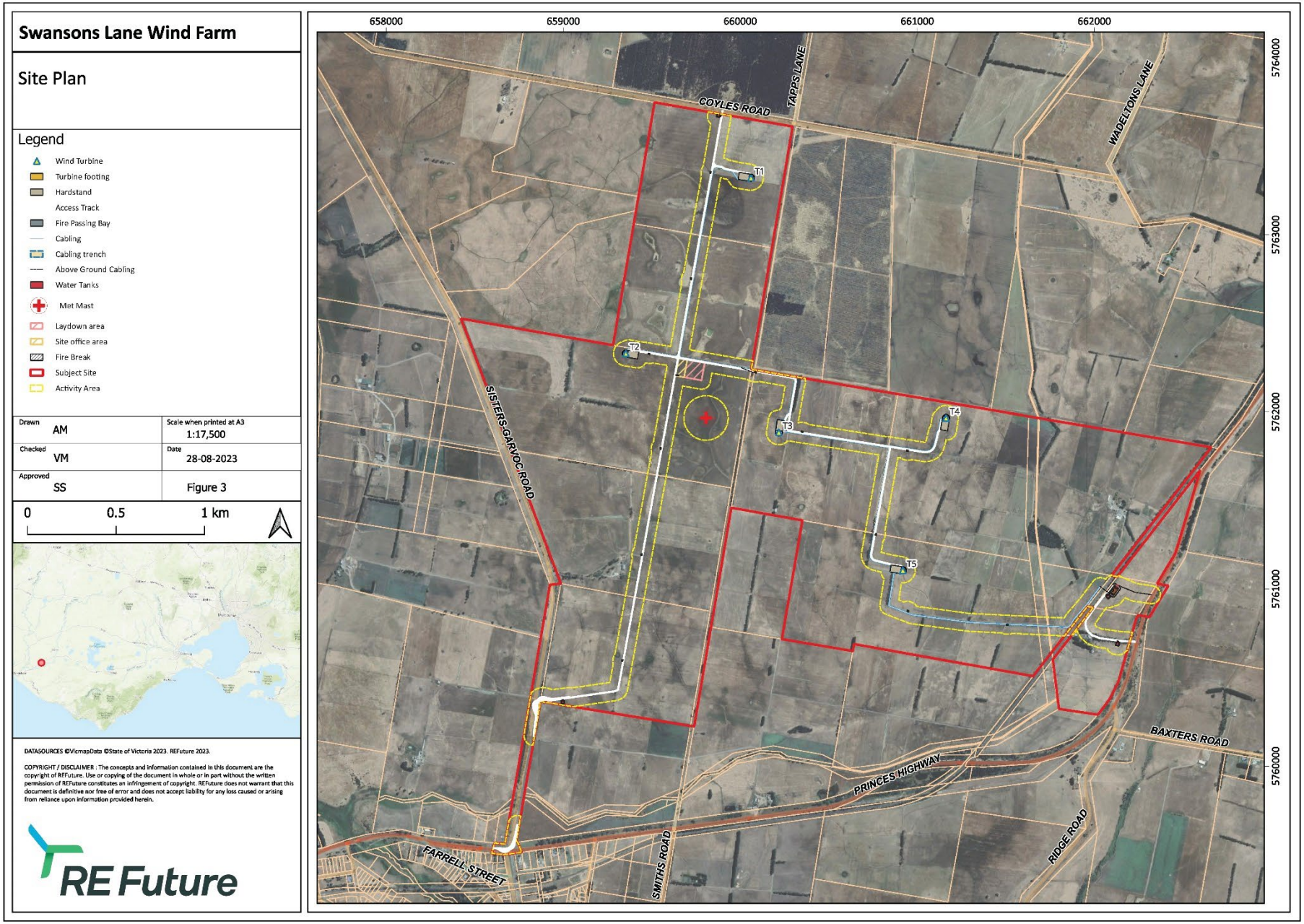


Figure 1 -Swansons Lane Wind Farm overview

4.2 Risk indicators

The following information has been obtained and provides relevant information that informs the analysis of risk. This information is primarily related to the existing bushfire risk that exists in the surrounding area.

4.2.1 Bushfire Management Overlay

The Bushfire Management Overlay (BMO) is a Planning Scheme Overlay provided within the Corangamite and Moyne Planning Schemes. It is reliant on areas of the municipality being identified as at risk from bushfire.

The criteria[1] to determine if a BMO should be implemented includes the identification of vegetation including forest, woodland, scrub, shrubland, mallee and rainforest vegetation that is 4 hectares or more in size. Once this is confirmed, a 150 metre buffer is applied from the edge of vegetation. Fire authorities also can advise locations that may be subject to extreme landscape bushfires.

Figure 2 outlines the location of the BMO in relation to this development. The proposed development has ensured that the WTG, terminal station or the BESS are not located within the BMO. The BMO in relation to this project is located to the north and east and is associated with plantations.

The fragmentation of the Plantation vegetation and that there is limited connection between the areas is unlikely to support an elevated landscape risk assessment outcome. There are several landscape features that will likely slow or stop bushfires spread. These include changes in vegetation types and the surrounding road network.

[1] https://www.planning.vic.gov.au/__data/assets/pdf_file/0027/447921/Fact-sheet-Bushfire-mapping-methodology-and-criteria.pdf

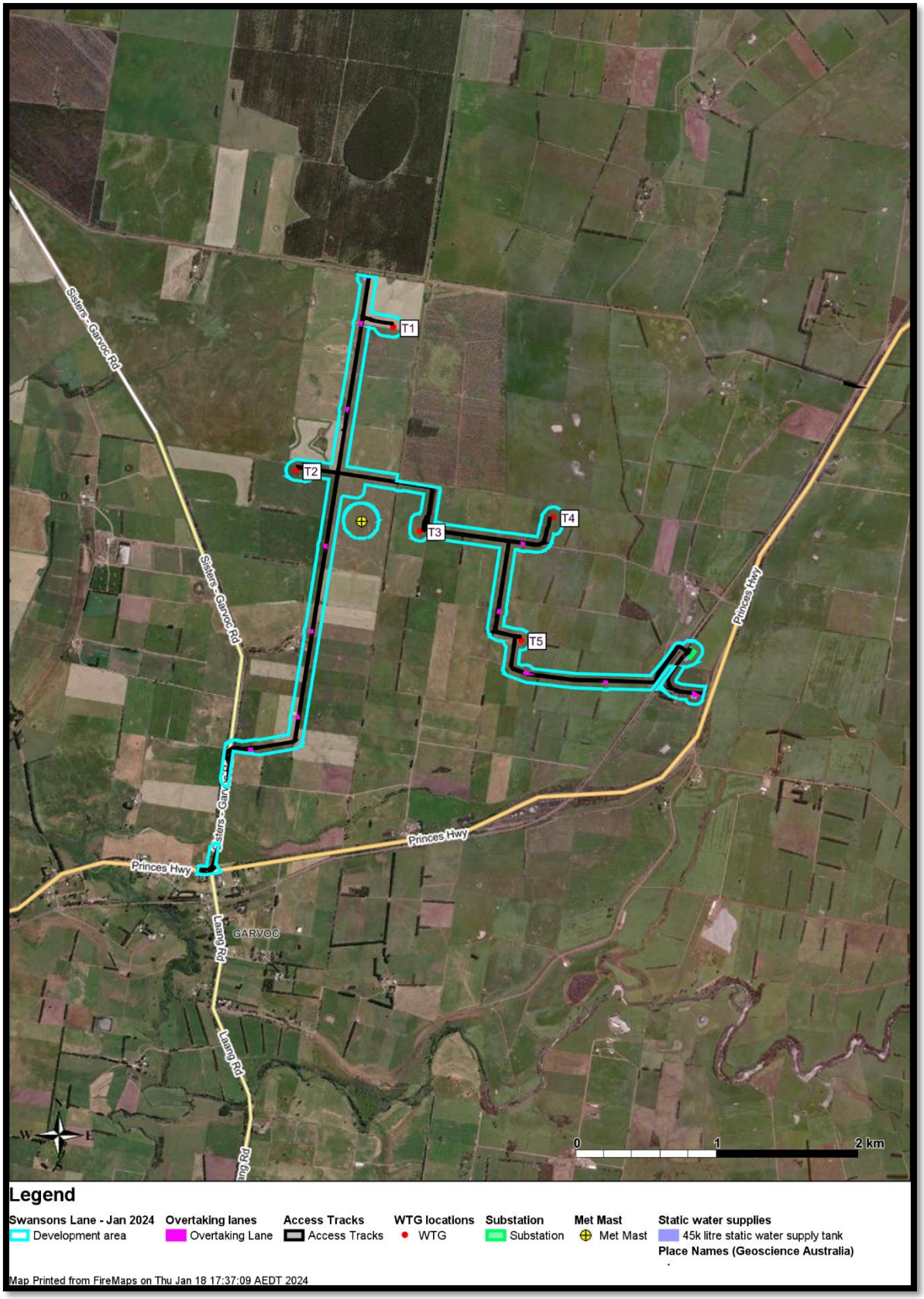


Figure 2 - Bushfire Management Overlay in relation to the development site

4.2.2 Bushfire Prone Area

Bushfire Prone Areas (BPA) are areas that are subject to, or likely to be subject to, bushfires. The Minister for Planning has determined that specific areas are designated BPAs for the purposes of the building control system. Specific bushfire construction standards apply in designated bushfire prone areas in Victoria.

These bushfire construction requirements are aimed at improving bushfire protection for residential buildings. The creation of the BPA map fulfils one of the 67 recommendations made by the Victorian Bushfires Royal Commission following the 2009 Black Saturday bushfires.

A minimum construction standard applies to new residential buildings, schools, childcare centres, hospitals, aged care facilities, industrial buildings and associated buildings in designated Bushfire Prone Areas.

Landowners are required to build to a minimum Bushfire Attack Level of 12.5 in these areas as outlined within AS3959:2018 *Building in bushfire prone areas*. The entire project area is within a BPA. The existence of the BPA will trigger the need to respond to Clause 13.02 of the Planning Scheme. Refer to Section 5.1.

4.2.3 Municipal Fire Management Plan[2]

Across the three municipalities of Corangamite, Surf Coast and Colac Otway, there is a single Strategic Fire Management Plan. Moyne Shire Council has a Municipal Fire Management Plan (MFMP). The plans recognise the similar hazard areas across the municipalities including grassland areas and large areas of Public Land.

The Corangamite, Surf Coast and Colac Otway Strategic Fire Management Plan provides an overview of the bushfire risk to the communities within the three municipalities. The Plan outlines the Garvoc location and indicates that the likelihood of a fire reaching the town and the potential for house loss to occur is low. The risk to the local area is primarily grass fires and this is demonstrated through the low likelihood ranking. The potential for this area to be impacted by embers is also considered very low and unlikely. This is consistent with the grassland dominating the surrounding landscape which is not likely to generate embers. A bushfire that burns through the plantations to the north east of the township will likely be under a north westerly or south westerly influence. This would likely not impact on the Garvoc area.

The plan doesn't articulate mitigation activities for the local risk. It does outline the role that agencies including CFA and Forest Fire Management Victoria are undertaking in educating communities and ensuring various treatments have been implemented including roadside slashing, private land vegetation management and community education programs.

The Moyne Municipal Fire Management Plan (MFMP) 2020 outlines the risk of fires within the municipality and outlines the treatments required to offset these risks. The MFMP was last updated and released in 2020.

[2] Otway District Strategic Fire management Plan 2021 – 2024 – Shire of Corangamite, Colac Otway and Surf Coast - https://www.corangamite.vic.gov.au/files/assets/public/documents/plans-amp-strategies/emergency/strategic-fire-management-plan-otway-district-2021-2024-final.pdf

The MFMP outlines that the bushfire season generally runs from December to March. The prevailing weather conditions are north westerly winds accompanied by high daytime temperatures and low relative humidity.

The MFMP indicates a level of risk for communities surrounding the proposed WEF. This includes:

Location	Consequence rating	Likelihood rating	Risk rating	Priority rating
Garvoc	Major	Likely	Very High	2A
Framlingham	Major	Likely	Very High	2A

The MFMP also outlines treatments for the localities, and this includes community education, roadside vegetation management, development and maintenance of strategic fire breaks and fuel hazard management. It has been assumed that the monitoring of the implementation of the treatments is also occurring through the committee established to develop the MFMP.

The MFMP outlines several roads within the surrounding landscape that have been identified as Strategic Fire Breaks. The listed roads have been allocated a treatment being either grazing, burning or slashing. This detail is available within the MFMP.

The existing strategic fire break network provides a network of fuel managed areas that may either slow or stop bushfires spread. As the Moyne Shire Council footprint largely covers the north west and south west bushfire approaches, the strategic fire breaks within the municipal footprint will be more likely to be effective in slowing or stopping bushfire spread.

The MFMP also outlines several treatments that are provided to address bushfire risk across the municipality. The treatments include:

- Community education programs
- Fire Danger Period advisory signs
- Neighbourhood Safer Places (Hawkesdale)
- Private property planning
- Municipal Fire Prevention Notices
- Fuel hazard reduction

4.2.4 Bushfire history

An analysis of bushfire history in the area surrounding the proposed Wind Farm indicates bushfire activity. According to the data provided by DELWP (Figure 4), some areas of this development has been impacted by bushfire in the past.

The most recent bushfire occurred on 17 March 2018. This bushfire occurred late in the bushfire season however due to the elevated temperatures and strong gusting north westerly winds, when the bushfire started to the north of Garvoc it quickly spread in a south easterly direction. The bushfire burnt through the development footprint and stopped to the south of Princes Highway.

In 1983 the Cudgee-Ballangeich bushfire impacted on the development area. This occurred under a south westerly wind influence that followed a north westerly. The bushfire was influenced by hot and gusty north westerly winds that pushed the bushfire towards the south east. After a south westerly wind change, the bushfire travelled towards the east.

Both of these bushfire events are indicative of the types of bushfire behavior that can occur under elevated fire danger conditions. These bushfires were highly influenced by the availability of vegetation, the road network and the varying fuel loads.

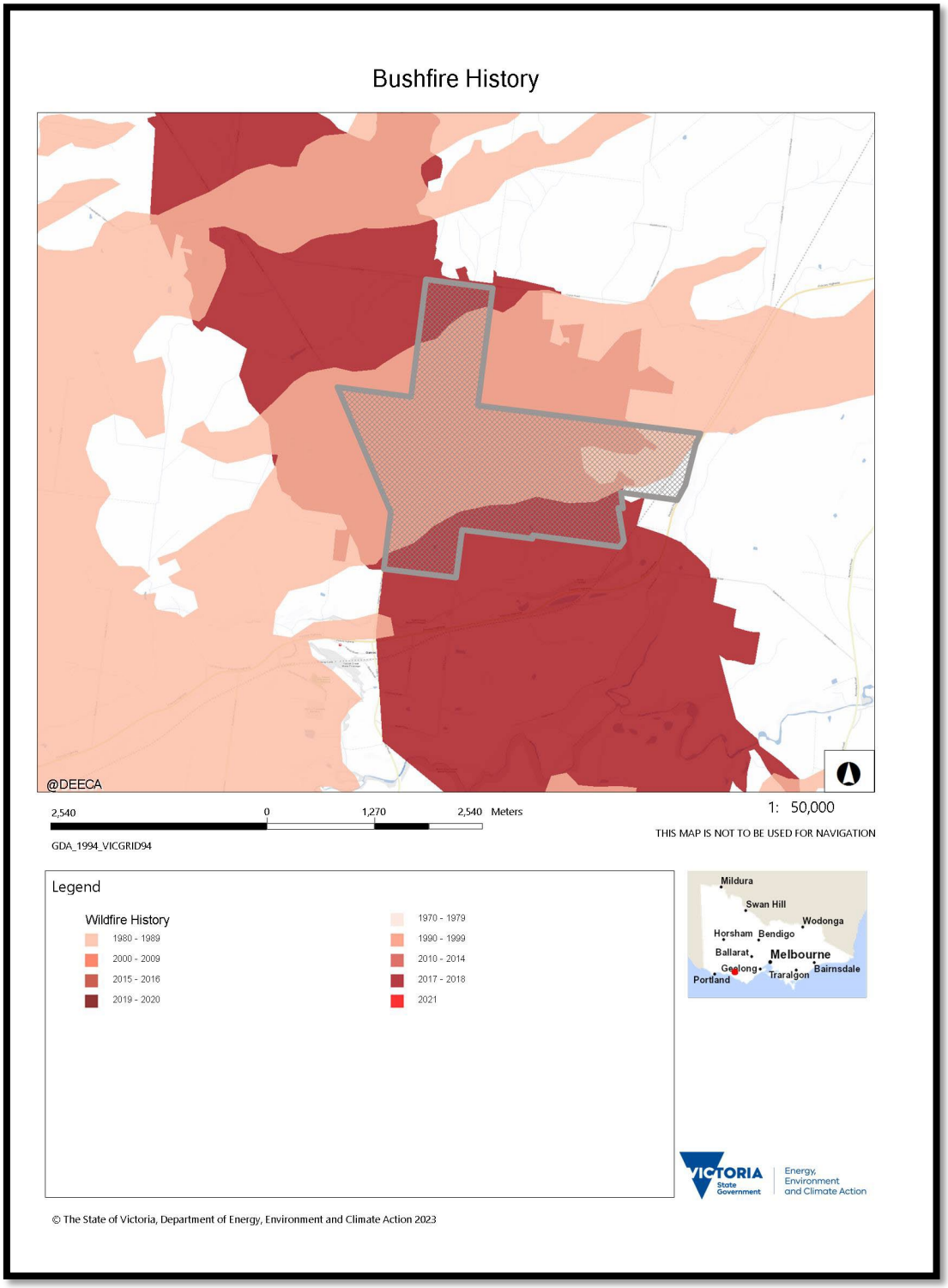


Figure 3 - Bushfire history with the Swanson Lane Wind Farm project boundary.

4.2.5 Surrounding vegetation

The vegetation within and surrounding the proposed Wind Energy Facility is primarily exotic pasture/grassland and scattered trees along with Plantation areas to the north and east of the development site. Figure 4 provides an overview of the vegetation within and surrounding the development according to available records.

The dominating vegetation is exotic grasses and plantations. Appendix 1 includes several photos that show the low fuel loads within the paddocks. The plantations are still young and were likely planted following the 2018 bushfire.

The surrounding grassland areas are primarily used for stock grazing. Depending on the time of the year that a bushfire occurs, it will be influenced by the farming activities that are occurring. This will result in a highly fragmented landscape where it is likely for multiple opportunities to be available for firefighters to undertake suppression activities.

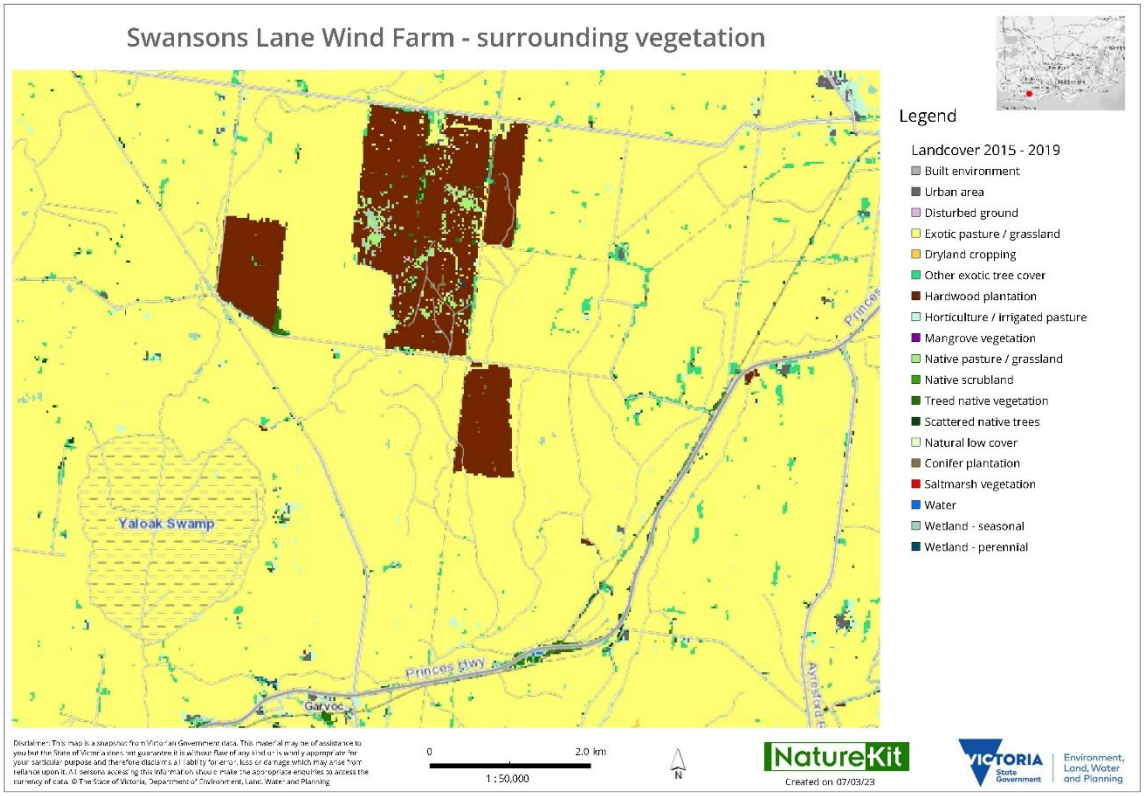


Figure 4 - Vegetation types

5 Risk assessment process

To effectively assess the fire risk associated with the proposal, this report is structured to assess risk using the following frameworks:

- Clause 13.02 – Bushfire Planning – Corangamite and Moyne Planning Scheme
- Assessment against the requirements of the CFA Guideline *Design Guidelines and Model Requirements: Renewable Energy Facilities 2022*
- Risk assessment that meets section 5 of the CFA Guidelines.

The risk assessment provides the opportunity to pull all the information together and make any additional recommendations that may be required to reduce risk to an acceptable level.

5.1 Clause 13.02 – Bushfire planning assessment

Clause 13.02 of the Corangamite and Moyne Planning Schemes plan to strengthen the resilience of settlements and communities and prioritise protection of human life through several objectives. However, it should be noted the Proposal does not introduce new settlements into the landscape. The assessment has been undertaken within the context of a Wind Energy Facility.

5.1.1 Bushfire hazard assessment

Elevated bushfire behaviour in south east Australia is often dominated by strong and gusty north westerly winds followed by a south westerly change that normally occurs in the afternoon or early evening. These conditions have historically caused the loss of life and property and are usually associated with elevated fire danger warnings issued by the fire agencies.

Table 1 below outlines the hazard assessment relating to the proposed development. Figures 5 and 6 provide an overview of the likely bushfire scenarios within the surrounding area. The assessment has identified the presence of the north westerly and south westerly bushfire impacts. It is acknowledged that bushfires may approach from other directions however the treatment of the risk from these aspects will be sufficient to offset bushfire approach from other directions.

Table 1 - Assessment against Clause 13.02

Bushfire hazard type	Conditions	Likely Scenario	Considerations
The site for the development	Once completed, the Wind Energy Facility will be required to comply with conditions that includes the management of vegetation around the base of the turbine towers during the fire danger period. During construction, there is a risk of a fire igniting and spreading through unmanaged vegetation. During the construction phase, the surrounding properties will continue to be used for farming activities including stock grazing.	A bushfire starting on the property is a possibility. Bushfires that are started by lightning, arson or other human caused events could burn through the Wind Farm development. The access track network and vegetation management around the base of the turbine towers will limit bushfire spread under elevated fire danger conditions. During construction, any works that is occurring near unmanaged grassland has the potential to start a bushfire and leave the property.	During the construction phase, all vegetation within 100 metres of works areas is to be managed during the fire danger period with all grassland less than 100mm in height. When the fire danger conditions are elevated (Catastrophic), the Emergency Management Plan will outline procedures to close the site during the construction phase. The Emergency Management Plan will also outline the requirements for limiting access and certain activities when the fire danger rating is elevated. The CFA Guideline requires the provision of vegetation management surrounding the base of the turbine towers. The access roads will be constructed during the construction phase and maintained for the life of the project.
Neighbourhood (400 metres) and local conditions (one kilometre)	Within one kilometre of the development, the surrounding landscape is predominantly grassland that is used for agricultural purposes and to the north and east are plantations.	Under strong wind conditions a bushfire can travel quickly across the landscape. Grassfires are heavily influenced by the quantity of fuels within the paddocks and the wind strength. Roadsides will contribute to bushfire spread due to the unmanaged fuels and the	The provision of access roads and vegetation management around the base of the turbine towers will limit the impact of a fire on development. The managed areas will limit the chances of a bushfire starting due to maintenance

	The surrounding road network provides access and egress opportunities and can, under lower bushfire conditions, be used as a fire break.	presence of trees that will likely generate short distance embers attack. A bushfire burning in the Plantation areas will burn with increased intensity and likely generate embers that will start new fires in front of the main bushfire front.	or other activities that may cause a bushfire.
Landscape conditions (10 kilometres)	The landscape surrounding the development site consists of primarily grassland. There are plantations to the north and east that will likely contribute to the development of embers. The plantations are located close to the development. The maximum fire run is approximately three kilometres. Beyond this area the landscape is dominated by agricultural properties.	The likely bushfire behaviour which will result in the greatest intensity and risk to the development will be from the north west due to the presence of the plantations. This is consistent with historical bushfires in the surrounding landscape. Grassfires under elevated bushfire conditions where the northwesterly wind influence is present through the day followed by a south westerly wind change can create conditions where the fires will be erratic. The presence of the surrounding road network and the high level of vegetation fragmentation will influence bushfire behaviour.	The protection of the turbine towers from bushfire spread and to prevent a fire spreading from the base of the turbine tower is required by the CFA Guideline. The provision of access roads will increase the ability for firefighters to access the areas surrounding the wind turbines. The plantations owners are required to prevent and suppress fires. This obligation is imposed through the CFA Act.

5.1.2 Bushfire Hazard Landscape Assessment

Figure 5 and 6 outlines the outcome of the bushfire hazard landscape assessment. The assessment identifies the two likely scenarios that may occur in relation to the Wind Energy Facility. Both scenarios are consistent in that the likely bushfire impact on the development is from either the north west or south west. Table 2 provides a description of each of the scenarios contained within Figure 6 and 7.

Table 2 - Bushfire scenarios

Scenario	Description
A	A bushfire that approaches from the north west is likely to be under elevated bushfire conditions. Traditionally a north westerly wind influence is associated with elevated fire danger days. The bushfire will be influenced by the availability of fuel including the plantations. The Turbines have been located at least 200 metres from the plantations which will ensure that the radiant heat impact will be minimal. The plantations will likely support the generation of embers that will start new fires ahead of the main fire. This will result in erratic bushfire behaviour like that experienced in 2018. The presence of setbacks from the farming properties and the ongoing maintenance of fire breaks around the plantations will assist with managing bushfires under lower fire danger conditions. The surrounding farming properties results in a highly fragmented landscape where varying fuel levels will be within the paddocks because of the grazing or cropping activities. Landscape features including the surrounding road network will provide opportunities to slow or stop bushfires spreading in the local area. The additional access tracks will increase the opportunities for fire suppression activities due to the ability to access all weather roads during the fire danger period.
B	A bushfire that approaches under a south westerly wind influence usually occurs after a north westerly wind has been experienced through the day. The wind change can occur after a bushfire has been burning for some time under the north westerly influence. Depending on the location of the bushfire, the entire western and southern side of the Wind Energy Facility can come under threat at the same time. As the bushfire travels through the treed areas and roadsides, it will likely generate embers that will land on or around the development and start new fires ahead of the bushfire front. Once the bushfire under these weather conditions enters the plantations, the embers and radiant heat will be directed away from the development. The fragmented vegetation that is associated with farming activities will influence bushfire behaviour. The road network will also contribute to slowing or stopping the bushfire spreading, in particular the Princes Highway to the south. The Highway is regularly managed and provides an effective strategic fire break.

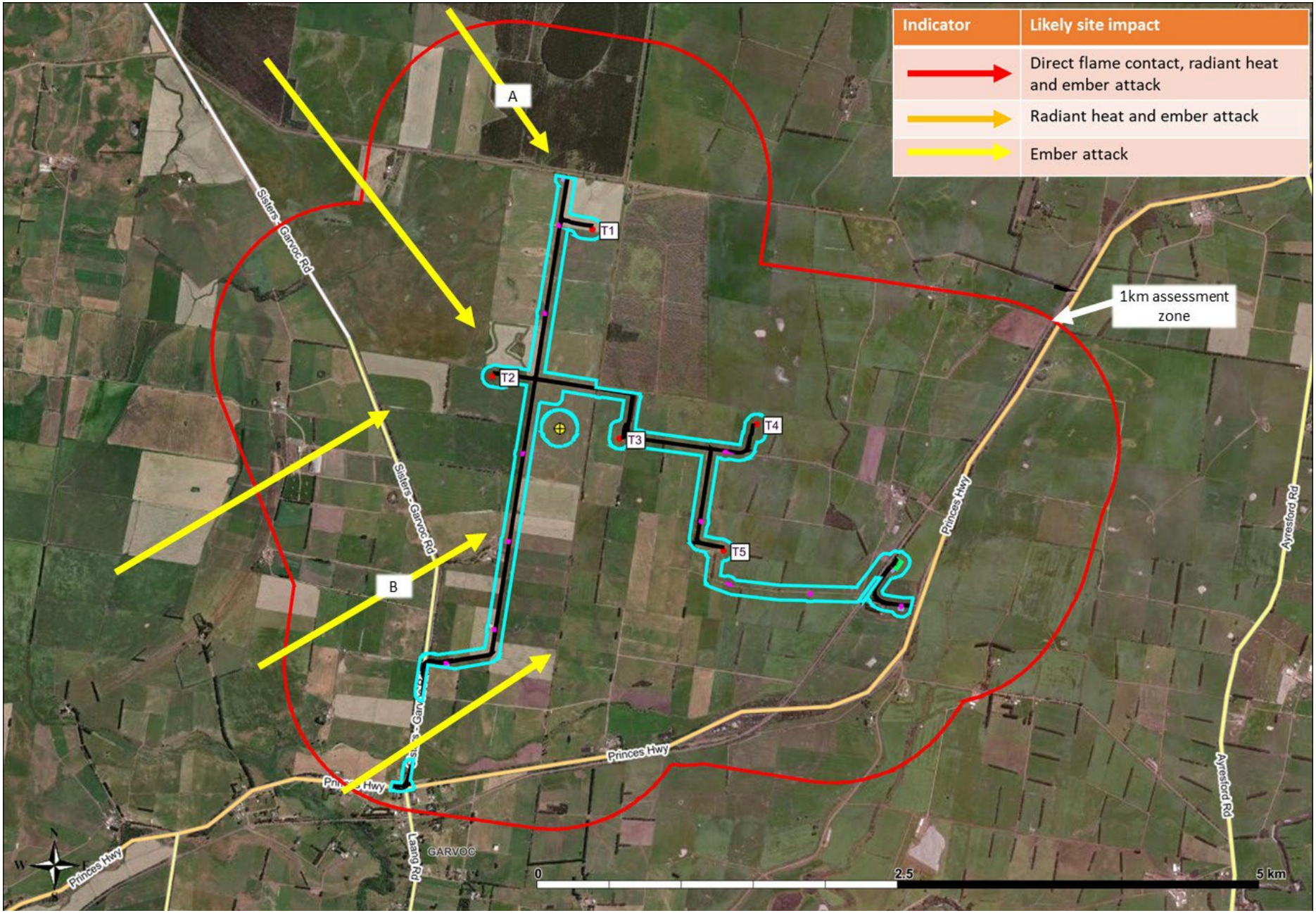


Figure 5 – One kilometre landscape assessment

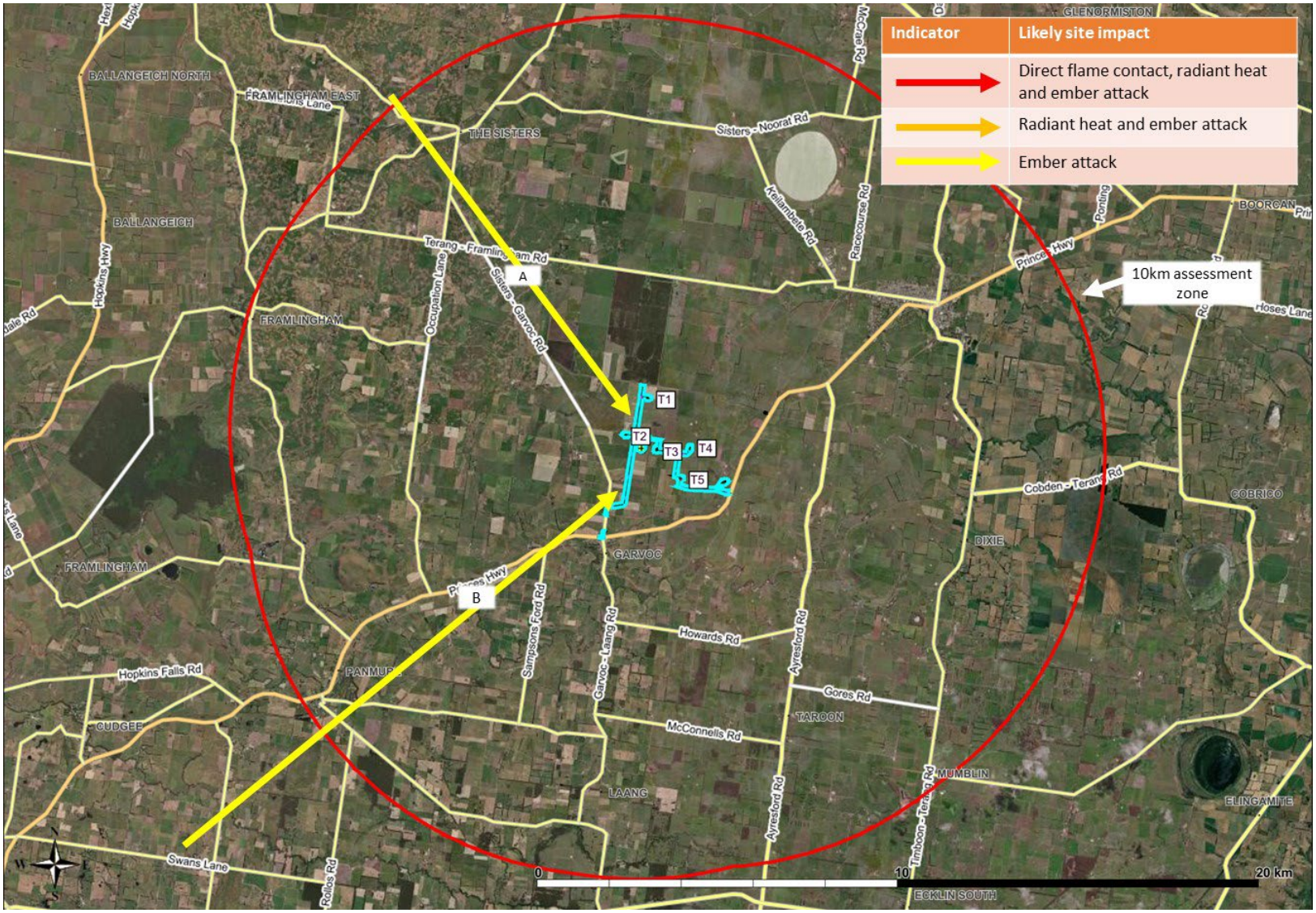


Figure 6 - 10 kilometre landscape assessment

Clause 13.02 Settlement Objectives are primarily related to settlement development of which it could be argued that a Wind Energy Facility does not meet these definitions. Regardless, an assessment of the project has been undertaken against the Settlement Objectives to allow for a detailed consideration of the project against the Clause 13.02 Policy.

Table 3 - Response to Clause 13.02 - Settlement Objectives

Settlement planning objectives	Project response	Achieved (✓ or ✗)
Directing population growth and development to low risk locations, being those locations assessed as having a radiant heat flux of less than 12.5 kilowatts/square metre under AS 3959-2009 Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2009).	This project does not promote population growth and will only have people onsite during the construction phase and when undertaking maintenance during the operations phase. The Turbines are setback approximately 200 metres from the plantations. As a result of this, the Turbines will be located in a BAL LOW are and exposed to less than 12.5 kW/m².	✓
Ensuring the availability of, and safe access to, areas assessed as a BAL-LOW rating under AS 3959-2009 Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2009) where human life can be better protected from the effects of bushfire.	The development is within a short drive to Warrnambool and Terang. The Garvoc township area may also provide a sufficient level of safety if last evacuation occurs. The identified safer locations and travel routes will be addressed within the Emergency Management Plan that is developed for the Wind Energy Facility.	✓
Ensuring the bushfire risk to existing and future residents, property and community infrastructure will not increase as a result of future land use and development.	The Wind Energy Facility will be provided with a range of protection measures that will ensure the bushfire risk to existing and future surrounding properties will not increase. These measures include: • Asset Protection Zone surrounding the base of each Turbine Tower, constriction compounds and Substation. • Fire detection and suppression system installed within the Nacelle of each wind turbine. • Access road network to be developed and maintained to allow for access to each of the towers. • Provision of static water supplies to support firefighting operations.	✓

	• Development of policies and procedures including hot works permit system, site access controls and an Emergency Management Plan that will outline the prevention and preparedness activities before and during elevated fire danger days.	
Achieving no net increase in risk to existing and future residents, property and community infrastructure, through the implementation of bushfire protection measures and where possible reducing bushfire risk overall.	The fire protection measures required by the CFA Guideline ensures that there is no net increase in risk to existing and future residents. The site for the Wind Energy Facility has been chosen to ensure separation from existing dwellings is achieved.	✓
Assessing and addressing the bushfire hazard posed to the settlement and the likely bushfire behaviour it will produce at a landscape, settlement, local, neighbourhood and site scale, including the potential for neighbourhood-scale destruction.	The bushfire risk has been assessed at the landscape level. This has identified the potential for long bushfire runs to occur from the north west and south west aspects. This development will not change the current expected bushfire behaviour in the landscape, it will likely reduce the risk in the surrounding areas due to the addition of an access track network and management around the base of the turbines.	✓
Assessing alternative low risk locations for settlement growth on a regional, municipal, settlement, local and neighbourhood basis.	The development of Wind Energy Facilities is required to occur in remote locations. This area has been chosen due to the low number of dwellings in the surrounding landscape. The CFA Guideline requirements is ensuring the management of risk is occurring based on the landscape bushfire risk.	✓
Not approving any strategic planning document, local planning policy, or planning scheme amendment that will result in the introduction or intensification of development in an area that has, or will on completion have, more than a BAL-12.5 rating under AS 3959-2009 Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2009).	The development will achieve a less than BAL 12.5 rating when assessed against AS3959 through the provision of Asset Protection Zones around the infrastructure.	✓

5.1.3 Assessment against Clause 13.02 summary

The assessment against Clause 13.02 has identified that the development is within an area where the landscape bushfire risk is influenced by the potential for grassfires and the development of embers from the Plantation vegetation. However, it has been designed to limit both the potential impact on the Wind Energy Facility and reducing the potential for fires to leave the property and enter the surrounding landscape. As the development will achieve the requirements outlined within the CFA Guidelines as a minimum, this will ensure that the settlement planning objectives are achieved.

5.2 Analysis against CFA Guideline

CFA have produced Guidelines that outline their requirements to address fire risk within renewable energy installations. Section 5 of the Guidelines outlines the process to analyse risk to enable the identification of hazards that may or can cause fires.

The CFA Guideline also specifies model requirements for renewable energy installations. Prior to the risk assessment being undertaken, it is important to assess the Wind Energy Facility project against these requirements. This will increase the effectiveness of the risk assessment.

The following table provides the model requirements from CFA's Guideline and how this project addresses the specific areas.

Table 4 - Response to CFA Guideline

Model requirement	Compliance	Comments
Section 2 – consulting with CFA		
a) Where located within a Bushfire Prone Area, bushfire risk is addressed according to the Victoria Planning Provisions, Clause 13.02-1S (Bushfire Planning), through bushfire hazard identification and assessment (including a bushfire hazard site and landscape assessment). This assessment must include risks to the proposed technologies from the landscape (bushfire/grassfire).	✓	This RMP includes an assessment against Clause 13.02 within Section 4.1.
b) Address risks from proposed technologies through a comprehensive risk management process, documented in a Risk Management Plan.	✓	This RMP assesses risk related to the proposed development.

Model requirement	Compliance	Comments
c) Indicate where the exact specifications of elements within the renewable energy facility will be determined during the detailed design phase, such as solar panel and wind turbine model/manufacturer and battery chemistry.	✓	This RMP considers the site layout and provides design solutions to manage the fire risk. The RMP will be updated following the Planning Permit approval being obtained. This will also include the development of a Fire Management Plan and Emergency Management Plan.
d) Explicitly state that the following documentation will be prepared in accordance with this guideline, in consultation with CFA, before development starts: • Risk Management Plan • Fire Management Plan • Emergency Management Plan	✓	This document is the Risk Management Plan. The outcomes of this assessment will inform the Fire Management Plan and Emergency Management Plan.
Section 3 – Risk Management Plan		
A Risk Management Plan must be developed for all renewable energy facilities. The Risk Management Plan must:		
a) Describe the infrastructure (natural and built), landscape, nature of operations and occupancy of the facility.	✓	Refer to Section 2 and 3.
b) Describe the risks and hazards at the facility to and from the renewable energy infrastructure (including battery energy storage systems).	✓	Refer to Section 5.
c) Specify and justify, in accordance with Section 4.2 of this guideline:		
• The location of the facility in the landscape, and the proposed infrastructure on-site.	✓	Refer to Section 4.3 of this Table.
• Emergency vehicle access to and within the facility that: ○ Includes site access points of a number	✓	Refer to Section 4.3 of this Table.

Model requirement	Compliance	Comments
suitable to the size and hazard of the facility (a minimum of two). ○ Provides access to renewable energy infrastructure, substations and fire service infrastructure.		
• Firefighting water supply for the facility.	✓	Refer to Section 4.3 of this Table.
• A fire break width of 10m or greater, based on radiant heat flux (output) as an ignition source: ○ Around the perimeter of the facility. ○ Between any landscape buffer/vegetation screening and infrastructure.	✓	Refer to Section 4.3 of this Table.
• The separation distance, based on radiant heat flux (output) as an ignition source, between: • Adjacent renewable energy infrastructure (e.g., between adjacent battery containers/enclosures). • Battery containers/enclosures and related battery infrastructure, buildings/structures, and vegetation.	✓	Refer to Section 4.3 of this Table.
• All other controls for the management of on and off-site hazards and risks at the facility (including all proposed battery energy storage system safety and protective systems).	✓	Refer to Section 4.3 of this Table.

Model requirement	Compliance	Comments
d) Provide an evidence-based determination of the effectiveness of the risk controls against the identified hazards, including justification for the omission of any battery safety and protective system/s.	✓	Refer to Section 5.
e) Form the basis for the design of the facility.	✓	The outcomes of this assessment have been incorporated within the design of the facility. They will also be incorporated within the Fire Management Plan and Emergency Management Plan when they are prepared.
Section 4- Facility Location and Design		
Section 4.1 – Facility Location		
Planning applications for all renewable energy facilities proposed in high-risk environments must address the following:		
a) An assessment against policy at Clause 13.02-1S (Bushfire Planning) where the facility is located in a Bushfire Prone Area (BPA).	✓	This RMP includes an assessment against Clause 13.02-1S.
b) The impact of any ignitions arising from the infrastructure (solar panels, wind turbines, battery energy storage systems, electrical infrastructure) on nearby communities, infrastructure and assets.	✓	This report considers the impact and the likelihood of fires that leave the property. The Clause 13.02 assessment has considered this and has also been addressed within the risk assessment in Section 5.
c) The impact of bushfire on the infrastructure (eg. ember attack, radiant heat impact, flame contact).	✓	This report considers the impact of bushfire on the infrastructure. The Clause 13.02 assessment considered this and has also been addressed within Section 5.
d) Assessment of whether the proposal will lead to an increase in risk to adjacent land and how the proposal will reduce risks at the site to an acceptable level.	✓	The Clause 13.02 assessment has considered this and determined that there will be no increase in bushfire risk because of the development. The requirements including managing vegetation around the base of the turbine towers, detection and suppression systems installed within the Nacelle and

Model requirement	Compliance	Comments
		provision of access roads supports the management of bushfire risk.
Section 4.2 – Facility Design		
Section 4.2.1 – Emergency vehicle access		
All facilities		
a) Construction of a four (4) metre perimeter road within the perimeter fire break.	✓	As outlined within the CFA Guideline, this is not required due to the nature of Wind Energy Facilities.
b) Roads must be of all-weather construction and capable of accommodating a vehicle of fifteen (15) tonnes.	✓	The Access Roads constructed for this development will be designed, constructed and maintained to achieve this requirement.
c) Constructed roads should be a minimum of four (4) metres in trafficable width with a four (4) metre vertical clearance for the width of the formed road surface.	✓	All Access Roads will be a minimum of four metres wide.
d) The average grade should be no more than 1 in 7 (14.4% or 8.1°) with a maximum of no more than 1 in 5 (20% or 11.3°) for no more than fifty (50) metres.	✓	The site is mainly flat with only small slopes present. There are no roads that will require assessment of the grade.
e) Dips in the road should have no more than a 1 in 8 (12.5% or 7.1°) entry and exit angle.	✓	The site is mainly flat with only small slopes present. There are no roads that will require assessment of dips.
f) Roads must incorporate passing bays at least every 600 metres, which must be at least twenty (20) metres long and have a minimum trafficable width of six (6) metres. Where roads are less than 600 metres long, at least one passing bay must be incorporated.	✓	Passing bays have been included within the design of the Access Roads for the site. They will be provided every 600 metres.
g) Road networks must enable responding emergency services to access all areas of the facility, including fire service infrastructure,	✓	The proposed access roads will provide direct access to the base of all wind turbines. Other infrastructure is located

Model requirement	Compliance	Comments
buildings, and battery energy storage systems and related infrastructure.		against Public Roads and is accessible by emergency service vehicles.
h) The provision of at least two (2) but preferably more access points to the facility, to ensure safe and efficient access to and egress from areas that may be impacted or involved in fire. The number of access points must be informed through a risk management process.	✓	As the development is a Wind Energy Facility, there are numerous access points located throughout the development.
Wind Energy Facilities		
Constructed roads developed during the construction phase of facilities must be maintained post-commissioning and throughout the operational life of the facility, to allow access to each turbine for maintenance and emergency management purposes.	✓	The access roads developed for the construction phase will be retained throughout the life of the project. This will provide access for maintenance activities along with emergency vehicle access if required.
Section 4.2.2 Firefighting Water Supply		
All Facilities		
a) Water access points must be clearly identifiable and unobstructed to ensure efficient access.	✓	Static water supplies will be located at the site entrances. The final location of static water supplies will be determined in conjunction with CFA.
b) Static water storage tank installations must comply with AS 2419.1-2005: Fire hydrant installations – System design, installation and commissioning.	✓	The static water tanks will be located within tanks that comply with AS2419.1:2015.
c) The static water storage tank(s) must be an above-ground water tank constructed of concrete or steel.	✓	The static water tanks will be above ground.

Model requirement	Compliance	Comments
d) The static water storage tank(s) must be capable of being completely refilled automatically or manually within 24 hours.	✓	Site management will have an arrangement with a local water carrier to ensure static water supplies are refilled within 24 hours. This will be addressed within the Emergency Management Plan.
e) The static water storage tanks must be located at vehicle access points to the facility and must be positioned at least ten (10) metres from any infrastructure (solar panels, wind turbines, battery energy storage systems, etc.).	✓	Static water tanks will be located at the key entrances to the access roads constructed for the wind turbine development. They will be located at least 10 metres from all infrastructure.
f) The hard-suction point must be provided, with a 150mm full bore isolation valve (Figure 1) equipped with a Storz connection, sized to comply with the required suction hydraulic performance. Adapters that may be required to match the connection are: 125mm, 100mm, 90mm, 75mm, 65mm Storz tree adapters (Figure 2) with a matching blank end cap to be provided.	✓	The static water tanks will be provided with a hard suction point and adapters that will allow for the typical firefighting appliances to access the water supplies.
g) The hard-suction point must be positioned within four (4) metres to a hardstand area and provide a clear access for emergency services personnel.	✓	The hard suction points will be accessible by firefighting appliances.
h) An all-weather road access and hardstand must be provided to the hard-suction point. The hardstand must be maintained to a minimum of 15 tonne GVM, eight (8) metres long and six (6) metres wide or to the satisfaction of the CFA.	✓	This has been included within the design.
i) The road access and hardstand must be kept clear at all times.	✓	This requirement will be specified within site procedures and the Emergency Management Plan.

Model requirement	Compliance	Comments
j) The hard-suction point must be protected from mechanical damage (eg. bollards) where necessary.	✓	Bollards will be provided that protects the static water tanks outlets from mechanical damage.
k) Where the access road has one entrance, a ten (10) metre radius turning circle must be provided at the tank.	✓	Turning provisions will be provided at the base of each wind turbine.
l) An external water level indicator must be provided to the tank and be visible from the hardstand area.	✓	This has been included within the design.
m) Signage (Figure 3) indicating 'FIRE WATER' and the tank capacity must be fixed to each tank.	✓	This has been included within the design.
n) Signage (Figure 4) must be provided at the front entrance to the facility, indicating the direction to the static water tank.	✓	Signage will be provided at all property entrances that shows the location of the closest static water supply to that location.
Wind Energy Facilities		
a) The fire protection system for wind energy facilities must incorporate at least one static fire water storage tank of at least 45,000L effective capacity at each site entrance.	✓	Following an assessment of the development, four 45,000 litre static water tanks are required at the points where the access roads meet the Public Roads.
b) Additional static fire water storage tanks of at least 45,000L effective capacity must also be incorporated in facility design. The number and location of tanks is to be determined through a comprehensive risk management process (Risk Management Plan), in consultation with CFA.	✓	Due to the low number of Turbines and the multiple access points that are provided, there is no additional water supplies being proposed. The placement of the water tanks at the main entrance points allows for firefighters to fill the appliance before entering the development site. The water tanks apart from the Coyles Road entrance are all located in areas that also provides a level of safety for firefighters. The proposed location of the static water supplies is outlined in Figure 1.

Model requirement	Compliance	Comments
c) Nacelles must be equipped with automatic fire detection, alarm and fire suppression systems.	✓	The Nacelles will be fitted with fire detection and suppression systems. Both of these systems will be monitored 24/7 by the onsite monitoring system and if activated, an alert will be sent to the site operator. The Emergency Management Plan will include procedures for alerting the CFA to a fire.
Section 4.2.3 Fire Detection and Suppression Equipment		
Suitable fire detection and suppression equipment must be provided:		
a) For on-site buildings and structures, according to the requirements of the National Construction Code.	✓	The buildings will comply with the National Construction Code where required.
b) For storages of dangerous goods, according to the requirements of any Australian Standards for storing and handling of dangerous goods.	✓	The storage of dangerous goods will comply with the relevant legislation.
c) For electrical installations, a minimum of two (2) suitable fire extinguishers must be provided within 3m-20m of each PCU.	✓	Fire extinguishers will be provided across the site and included within the Fire Management Plan.
d) In all vehicles and heavy equipment, each vehicle must carry at least a nine (9)-litre water stored-pressure fire extinguisher with a minimum rating of 3A, or other firefighting equipment as a minimum when on-site during the Fire Danger Period.	✓	This requirement will be specified within the Fire Management Plan.
Section 4.2.5 – Fire Breaks		
A fire break must be established and maintained around:		
a) The perimeter of the facility, commencing from the boundary of the facility or from the vegetation screening inside the property boundary.	✓	A fire break will be provided around the base of each wind turbine. As there is no perimeter for this project, this requirement is not required.

Model requirement	Compliance	Comments
b) The perimeter of control rooms, electricity compounds, substations and all other buildings onsite. The width of fire breaks must be a minimum of 10m, and at least the distance where radiant heat flux (output) from the vegetation does not create the potential for ignition of on-site infrastructure.	✓	All infrastructure will be provided with a 10 metre wide fire break including: • Works compound • Substation • Static water supplies
Wind Energy Facilities		
A fire break must be established and maintained around the base of wind turbines.	✓	All wind turbines will be provided with a fire break of 10 metres around the base of the turbine tower. It is also acknowledged that the site operators through their regular inspection program will engage with landowners if the surrounding landscape becomes unmanaged through the life of the project.
Section 4.2.6 – Design Specific to Facility Type		
Wind Energy Facilities		
a) Wind turbines must be located no less than 300 metres apart.	✓	This has been included within the design.
b) Wind turbines must be provided with automatic shut-down, and the ability to be completely disconnected from the power supply in the event of fire.	✓	This requirement has been included within the project specifications.
c) Installed weather monitoring stations must be notified to the Civil Aviation Safety Authority (CASA) as per CASA Advisory Circular AC 139-08, v2.0, March 2018 (as for all structures 110m or more above the ground).	✓	This will be undertaken during the project.
d) All guy wires and monitoring towers must be clearly marked,	✓	This will be undertaken during the project.

Model requirement	Compliance	Comments
even where marking is not required by CASA.		
Section 5 – Facility Construction and Commissioning		
Section 5.1.4 – Emergency Management		
An Emergency Plan must be developed for the construction and commissioning phase, before development starts.	✓	An Emergency Management Plan will be developed for both the construction and operations phase.
Section 6 – Facility Operation		
Section 6.1 – Fire Management Plan		
A Fire Management Plan must be developed for the facility, in consultation with CFA, before development starts.	✓	A Fire Management Plan will be developed for both the construction and operations phase.
Section 6.2.1 – Fire Hazards and Risk Controls		
If your facility is at-risk of bushfire, prevention and preparedness activities must be detailed in the Fire Management Plan.	✓	Appropriate procedures will be incorporated within the Fire Management Plan and Emergency Management Plan that addresses the bushfire risk.
Section 6.2.2 – Vegetation and Fuel Management		
Facility operators must undertake the following measures during the Fire Danger Period:		
a) Grass must be maintained at or below 100mm in height during the declared Fire Danger Period.	✓	This requirement will be included within the Fire Management Plan for the areas surrounding the substation and the office compound.
b) Long grass and/or deep leaf litter must not be present in areas where heavy equipment will be working, during construction or operation.	✓	This requirement will be included within the Fire Management Plan.
c) Restrictions and guidance must be adhered to during the Fire Danger Period, days of high (and	✓	This requirement will be included within the Fire Management Plan.

Model requirement	Compliance	Comments
above) fire danger and Total Fire Ban days (refer to www.cfa.vic.gov.au).		
Section 6.2 4–Facility and System Monitoring		
Appropriate monitoring for facility infrastructure must be provided, to ensure that any shorts, faults or equipment failures with the potential to ignite or propagate fire are rapidly identified and controlled. Any fire must be notified to 000 immediately.	✓	The site will be monitored by a SCADA system that is remotely monitored. All alerts will be received at the Monitoring Centre and a procedure will be in place to determine the most effective response that may include the following: • Activation of the Estop systems. • Deploy a technician to the site. • Call 000 and request emergency service assistance.
6.2.5 – Maintenance		
Inspection, maintenance and any required repair activities must be conducted for all infrastructure, equipment and vehicles at the facility. Maintenance must be in line with any relevant Australian Standards and the manufacturer's requirements.	✓	This will be outlined within the Fire Management Plan.
Section 7 –Emergency Planning		
An Emergency Plan must be developed specific to the facility, in conjunction with CFA, before development starts.	✓	An Emergency Management Plan will be developed prior to construction commencing.
Section 8 – Provision of emergency information		
An Emergency Information Book must be developed and available to emergency responders. Emergency Information Books must be located in Emergency Information Containers, provided at each vehicle entrance the facility.	✓	An Emergency Information Book will be provided at the main entrance and the emergency entrance in a container that is protected from weather.

6 Risk Assessment

6.1 Introduction

The risk assessment process involves identifying, analysing, evaluating and treating the identified risks. The overall risk assessment process requires a consistent approach and follows *AS ISO 31000:2018 Risk management – Guideline*s as incorporated into the National Emergency Risk Assessment Guidelines (NERAG). Figure 1 provides an overview of the risk assessment process as outlined within *AS ISO 31000:2018 Risk management – Guidelines*.

Risk management is the process of recognising risk and developing methods to both minimise and manage the risk. This requires the development of a method to identify, prioritise, treat (deal with), control and monitor risk exposures.

A risk assessment is a function of the likelihood of an adverse event occurring and the consequence of the event. A comprehensive risk assessment will identify potential risks and consequences and therefore assist with the development of mitigation actions.

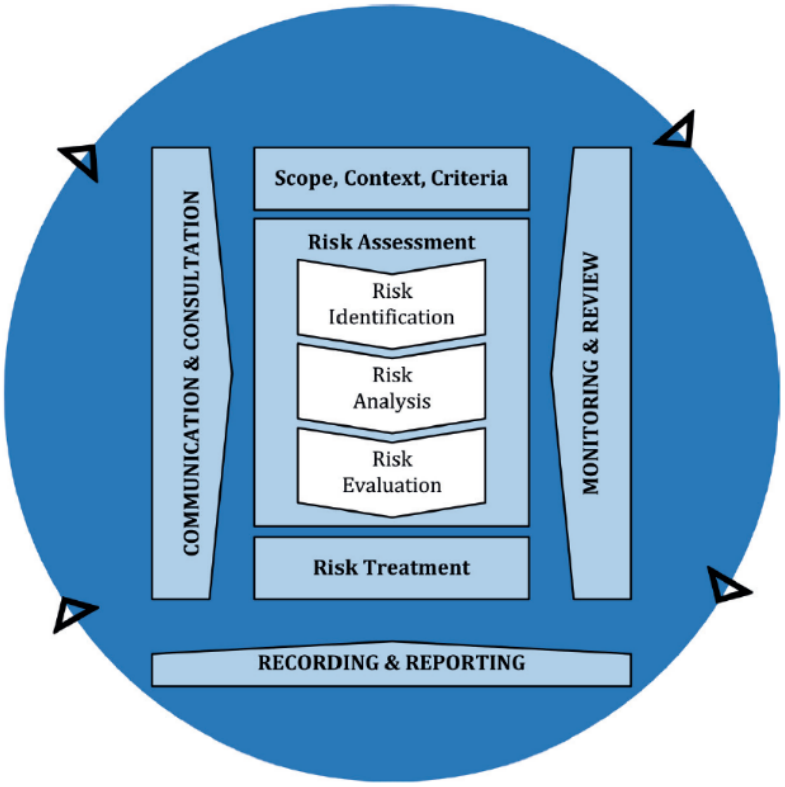


Figure 7 - Overview of AS/NZS ISO 31000-2018 risk management process

This report seeks to follow the steps outlined within the risk management guideline along with the process outlined within NERAG. The outcome of this assessment is a detailed understanding of hazards, the likelihood and consequence of a hazard becoming an emergency, and the treatments identified to manage this risk.

6.2 Context

The assessment of fire risk is a key requirement imposed on the development by CFA through their Guidelines. The CFA Guideline outlines the types of hazards that may need to be considered in relation to Wind Energy Facilities at the design, construction and operation phases.

6.3 Analysis of fire risk

Wind Energy Facility infrastructure is largely acknowledged as having limited potential to cause fires and is considered reasonably safe. There have been fires previously and these have been considered during the assessment of risk outlined within this report.

It is important the assessment of risk considers the various stages of the project including construction and the operations phase.

6.3.1 Assessment of fire risk during construction

The construction phase includes various stages including site works, construction of footings and the installation of the turbine towers. This stage also includes the commissioning of the technology and other systems including fire protection systems. This ensures the relevant connectivity is installed to ensure that all alerts and system messages are transmitted to an appropriate monitoring location.

The location of the development could mean that construction is occurring on elevated fire danger days. There is a risk of both causing a fire or being impacted by a fire.

6.3.2 Assessment of fire risk during operations

The operations phase follows the commissioning stage of the project, and the role of maintenance becomes critical to ensure that the system operates as it was designed, for the life of the development. The ongoing maintenance of the infrastructure and development is critical to ensure the ongoing management of fire risk.

All the system components are to be considered as critical as they all are contributing to the ongoing safe operations. The system components include monitoring connectivity, fire protection systems, vegetation management and other safety systems.

6.4 Risk identification

Through discussions with the client, review of various documentation and the consideration of previous fire history that involved Wind Energy Facilities, the following hazards have been identified:

Figure 8 - Hazard identification and description

Hazard	Description
Electrical hazards causing a fire	Electrical faults and/or hazards can be a key cause of fire in a Wind Energy Facility. A fault that occurred within the Nacelle is not easily accessed and operators would need to try and manage the fault remotely prior to a technician being able to access the Nacelle.
Fire causing spread to adjoining infrastructure on the property	A fire that has started in the development may spread to adjoining infrastructure or surrounding facilities. Rapid escalation of the fire size and complexity can create issues for onsite staff and contractors, firefighters and the community.
Fire causing offsite impacts	Any fire within the Wind Energy Facility can spread to adjoining properties most likely through vegetation connectivity. On elevated bushfire risk days, the operation can start fires in the surrounding landscape that can threaten the community.
Offsite fire impacting on the site	A bushfire burning through the surrounding landscape can enter the property and threaten the infrastructure by potentially starting new fires.
Staff and firefighters	The response to a fire by staff, contractors or firefighters can be dangerous due to the various safety hazards associated with a fire in this type of infrastructure.

The above list may not be exhaustive however it is believed that it will allow the assessment of most hazards that may be encountered in a development of this type.

6.5 Risk analysis

The analysis of risk requires the consideration of the likelihood and consequence of an event occurring and measuring this against a predetermined matrix to enable the consideration of each risk both individually and collectively.

For this assessment, a 3 x 3 matrix has been developed that enables the effective consideration of risk and to enable a comparison between the outcome of the hazard assessment.

6.5.1 Likelihood

An assessment of the likelihood of a fire occurring at this development including the potential to impact on people and other infrastructure/property is a key part of the risk assessment. The following will be considered during the assessment of an event occurring:

- Potential for an unplanned fire to occur
- Potential for this ignition to develop and exhibit significant fire behaviour
- Potential for that fire to destroy assets
- Potential for people to be affected or threatened
- The potential for it to develop into a major fire.

Recommendations for mitigation actions in the area may be determined by a number of approaches depending on the level of assessed risk. Strategies to lower risk are provided to ensure the risk is managed to an acceptable level.

An assessment of likelihood considers factors such as:

- Sources of ignition
- Use of the property and/or surrounding area
- History of ignitions within similar infrastructure
- Ability to spread from the property.

Table 5 - Likelihood table

Likelihood scale frequency	Description
Very Likely	Almost certain and will definitely occur, and /or high level of recorded incidents, or there is a strong likelihood that the event will occur.
Likely	High probability it may occur; and/or some recorded incidents.
Unlikely	It is not expected to occur, but it is not impossible.

6.5.2 Consequence

Consequence refers to the potential damage that could result from a fire occurring in relation to people and assets. In assessing the possible consequences, the assessment considers a variety of hazard, exposure and vulnerability factors including:

- The likely number of people at the facility
- The proximity of other assets
- The location of surrounding properties and the type of activities
- Response capability if an event occurred.

The consequence scale refers to the potential impacts which could occur should a fire occur.

Table 6 - Risk assessment consequence table

Consequence scale	Description
Major	• Significant consequences that may include long term closure of the site, major damage or effect. • Loss of life and/or significant injuries that cause disability. • Major offsite impacts causing destruction of other assets or life loss.
Moderate	• Moderate loss of property with the facility operating again in the short term. • Medical treatment may be required but no fatalities or long term affects.

	• Localised damage that can be rectified. • Some environmental impact with short to long-term effects.
Minor	• Minor or negligible consequences or effects. • Isolated damage to property with no ongoing impact on operations. • First aid injuries with no hospitalisations required. • Impact on the environment with short term effects.

The risk rating table is used to combine likelihood and consequence to obtain a risk score. The risk score is used to aid decision making by determining which areas are at the greatest risk of a fire starting and spreading through the estate. Actions can be prioritised using this method to determine where risk mitigation works will occur.

Table 7 - Risk rating table

RISK RATING TABLE			
	CONSEQUENCE		
	Minor	**Moderate**	**Major**
LIKELIHOOD	Minor or negligible consequences or effects. Isolated damage to property with no ongoing impact on operations. First aid injuries with no hospitalisations required. Impact on the environment with short term effects.	Moderate loss of property with the facility operating again in the short term. Medical treatment may be required but no fatalities or long term affects. Localised damage that can be rectified. Some environmental impact with short to long-term effects.	Significant consequences that may include long term closure of the site, major damage or effect. Loss of life and/or significant injuries that cause disability. Major offsite impacts causing destruction of other assets or life loss.
Very Likely: Almost certain and will definitely occur, and /or high level of recorded incidents, or there is a strong likelihood that the event will occur.	Medium	Very High	Extreme
Likely: High probability it may occur; and/or some recorded incidents.	Medium	High	Very High
Unlikely: It is not expected to occur, but it is not impossible.	Low	Medium	High

The outcomes of the risk assessment are used to inform the recommendations. These are aimed at providing guidance to management to reduce the fire risk at the property.

6.5.3 Risk analysis worksheets

The following worksheets have assessed the hazards identified in section 5.4 and results in a risk classification along with strategies to lower risk if it is deemed required. The initial assessment of risk is based on the information that has been supplied to date. The development of additional strategies to lower risk are made as either there was no information provided that identified the treatment or further clarity is required to considered.

Table 8 - Risk assessment - Electrical hazards causing a fire

RISK	Electrical hazards causing a fire
CAUSE	Electrical faults and/or hazards can be a cause of fire in Wind Turbines. Hazards may include faults, loss of remote monitoring systems, internal short circuits and overheating. The substation due to the presence of electrically charged equipment may, due to a fault or other cause catch fire.
LIKELIHOOD	Likely
JUSTIFICATION	There is a history of fires within Wind Energy Facilities including substations. Available data does not indicate that this is widespread. Modern nacelles are fitted with smoke detection and suppression systems and other safety systems to either prevent a fault from occurring or to automatically commence shut down procedures if required. They will also send alerts to site operators. Fires usually occur within the Nacelle which is located at the top of the tower and is where the turbine is located. These areas are difficult to access and rely on trained technicians being available. The turbine and associated equipment will be maintained as per the manufacturer's specifications.
CONSEQUENCE	Minor
JUSTIFICATION	A fire is unlikely to occur in more than one turbine due to the separation between the towers. A loss of a single turbine will not impact on business operations. Due to the remoteness of the infrastructure, they will unlikely cause issues that will impact on surrounding people or property. If the multiple layers of protection fail or are not able to suppress the fire, then it is highly likely for the entire nacelle to be destroyed in the fire. This is a highly unlikely scenario. The multiple layers include: • Smoke detection and fire suppression system. • Monitoring systems that detect faults. • Electrical system manufactured and installed in accordance with the relevant Standards.
RISK RATING	Medium
STRATEGY TO LOWER RISK	The requirements outlined within the response to the CFA Guideline will be sufficient to ensure the risk is maintained as medium and does not increase. Other requirements that will further reduce the risk include: • Development of an Emergency Management Plan that includes in addition to that required by CFA and AS3745:

	○ A system to communicate effectively between the monitoring centre and the onsite staff and contractors. ○ Provision of 24/7 technical expert contact details for the fire brigade to contact in the event of an emergency or threat of an emergency. • Developing a procedure that requires a technician to be deployed to the site when the site monitoring communications are down. • The site monitoring system will indicate the early stages of a fault or emergency event and provides the ability to commence shut down procedures remotely from the site.
RESIDUAL RISK	Low (unlikely/minor)

Table 9 - Risk assessment - Fire causing spread to adjoining infrastructure on the property

RISK	Fire causing spread to adjoining infrastructure on the property
CAUSE	A fire that starts within a nacelle may spread to adjoining infrastructure.
LIKELIHOOD	Unlikely
JUSTIFICATION	A fire that starts within a nacelle may drop burning materials to the ground and depending on the weather conditions, may spread to an adjoining turbine tower or other infrastructure. Due to the separation between the infrastructure this is highly unlikely to occur.
CONSEQUENCE	Minor
JUSTIFICATION	The consequence of a fire affecting adjoining areas of the plant is likely to be minor due to the provision of fire breaks around the base of the turbine towers and the substation and office compound. The existing road network along with the proposed access roads will assist with slowing or stopping fire spread between the turbine towers and other infrastructure.
RISK RATING	Low
STRATEGY TO LOWER RISK	Due to the low rating, no additional strategies are required to be implemented beyond compliance with the CFA Guideline as outlined in Section 4.
RESIDUAL RISK	Low

Table 10 - Risk assessment - Fire causing offsite impacts

RISK	Fire causing offsite impacts
CAUSE	Any fire within the Wind Energy Facility can spread to adjoining properties most likely through vegetation connectivity. These types of fires would occur on elevated fire danger days during the summer months.
LIKELIHOOD	Unlikely
JUSTIFICATION	The compliance with CFA Guidelines requires a range of mitigation strategies implemented including: • Provision of a fire break surrounding the Wind Energy Facility infrastructure. • Static water supplies for firefighting purposes is scattered through the development. • The monitoring system provides for early notification of a fault and will have the ability to remotely shut down the site if required.
CONSEQUENCE	Minor
JUSTIFICATION	The Clause 13.02 assessment has identified the limited risk for a fire to spread from the site into the surrounding landscape. The creation of fire breaks surrounding the wind turbines and the substation and works compound will reduce the potential for a fire to leave the infrastructure. The surrounding landscape is well managed due to farming operations. This will assist with reducing the potential for bushfires to leave the site and impact on the surrounding community. The existing plantations are provided with setbacks and perimeter access tracks that will slow or stop fire spread.
RISK RATING	Low
STRATEGY TO LOWER RISK	The site Emergency Management Plan will include a procedure for contacting the Municipal Fire Prevention Officer (MFPO) if the vegetation on adjoining properties becomes a fire risk. The MFPO may, following an assessment issue a Notice requiring the vegetation to be managed. Any vegetation growth on the property will be managed and removed. During the fire danger period, additional inspections will occur to ensure that all weeds and other vegetation is removed from the fire break and other areas.
RESIDUAL RISK	Low

Table 11 - Risk assessment - Offsite fire impacting on the site

RISK	Offsite fire impacting on the site
CAUSE	A bushfire burning through the surrounding landscape can occur in the area and threaten the infrastructure by potentially starting new fires. The plantations will likely generate embers that will start new fires ahead of the main fire front. The Turbines have been located sufficient distance to eliminate elevated levels of radiant heat.
LIKELIHOOD	Unlikely
JUSTIFICATION	The Clause 13.02 assessment has identified the surrounding landscape as having the potential for supporting a bushfire. It identifies two major fires that occurred in 1983 and 2018 which impacted on parts of the development site. The municipal fire management planning process does not identify this area as having a significant impact on property survivability due to the lack of vegetation that would support large scale ember impact. The provision of a firebreak and other managed areas will limit the ability for a bushfire to impact on the property.
CONSEQUENCE	Minor
JUSTIFICATION	Due to the separation between the wind turbines and other infrastructure, the possibility of multiple turbine towers being impacted by a bushfire is reduced. The provision of fire breaks around the base of the towers will ensure a bushfire can't directly impact on the structure.
RISK RATING	Low
STRATEGY TO LOWER RISK	Prior to construction commencing, an Emergency Management Plan will be developed that includes the requirements for vacating the site when the fire danger is elevated during both construction and operations phases of the project.
RESIDUAL RISK	Low

Table 12 - Risk assessment – Staff and firefighters

RISK	Staff and firefighters
CAUSE	The response to a fire by staff, contractors or firefighters can be dangerous due to the various safety hazards associated with a fire in this type of infrastructure.
LIKELIHOOD	Likely
JUSTIFICATION	There is the potential for firefighters and/or staff and contractors to be present during an emergency event and not being familiar with the site and the infrastructure. The CFA Guideline does impose a variety of controls onto the management of the site through the Emergency Management Plan and how CFA interacts with the site if they are called to a fire.
CONSEQUENCE	Moderate
JUSTIFICATION	The provision of an Emergency Information Container that will include the Emergency Management Plan, site plans and contact details for technical specialists will ensure responding firefighters seek information prior to entering the property. The local CFA brigades will be provided the opportunity to tour the facility regularly.
RISK RATING	High
STRATEGY TO LOWER RISK	In all cases a technician will be dispatched to the site to review any faults or alerts that may if not checked, cause a fire. Any faults that are sent to the monitoring centre will be assessed and a technician deployed to make an initial assessment. The Emergency Management Plan will include a requirement to engage with the responding firefighters early to ensure they are aware that a technician is on their way and that entry to the site can wait until they arrive unless there is a life or property protection emergency. The Emergency Information Container that is required by the CFA Guidelines will provide detailed contact information for responding firefighters to seek specialist advice prior to accessing the property.
RESIDUAL RISK	Medium

7 Conclusion

The assessment of risk for the Wind Energy Facility has identified that this development can occur safely providing the requirements outlined within this Risk Management Plan are implemented.

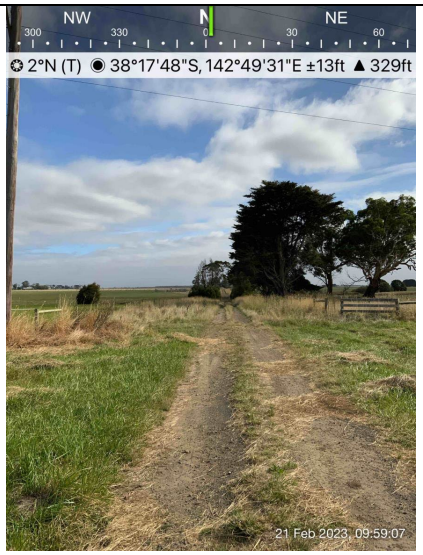
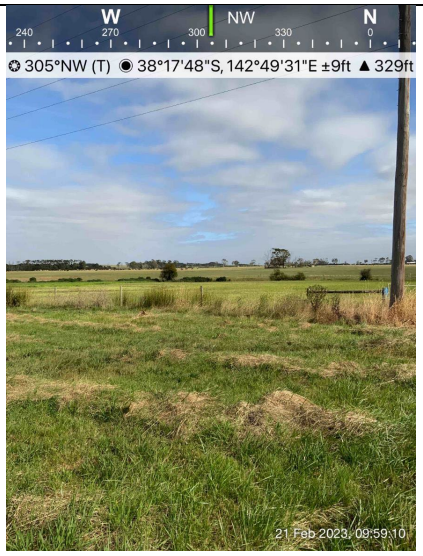
This report acknowledges the bushfire risk in the surrounding landscape that includes adjoining farming properties and plantations, and it has demonstrated how the design will reduce the potential for fire to either enter or leave the property.

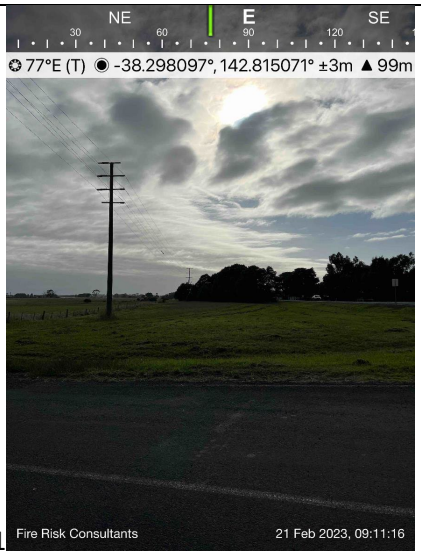
The assessment of fire history in relation to Wind Energy Facilities identifies limited examples of where these systems have caused fires. There is no doubt that a wind turbine can present fire risks if not designed, constructed, commissioned and operated effectively. The importance of following design requirements and committing to the ongoing maintenance of the system is critical to reduce fire risk.

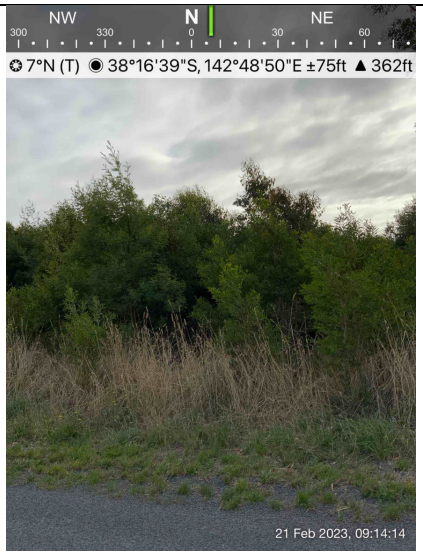
The additional requirements imposed on the development by the CFA Guideline and this Risk Management Plan will strengthen the management of fire risk. In addition to this, following the issue of a Planning Permit, the development of a Fire Management Plan and Emergency Management Plan that meets the requirements of the CFA Guideline will assist with managing the risk of fire.

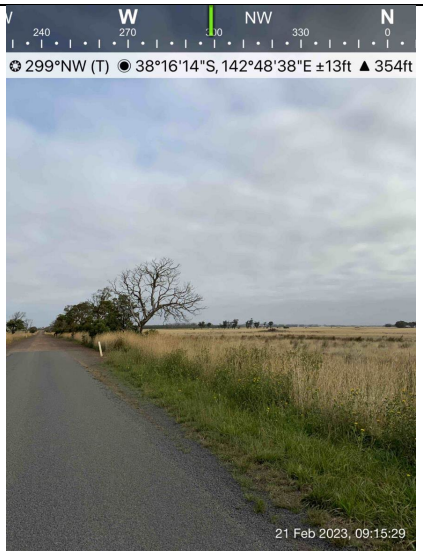
The results of this assessment should provide confidence that the operator of the Wind Energy Facility will introduce systems, procedures and maintenance programs to ensure fire risk is managed.

Appendix A – Site photos

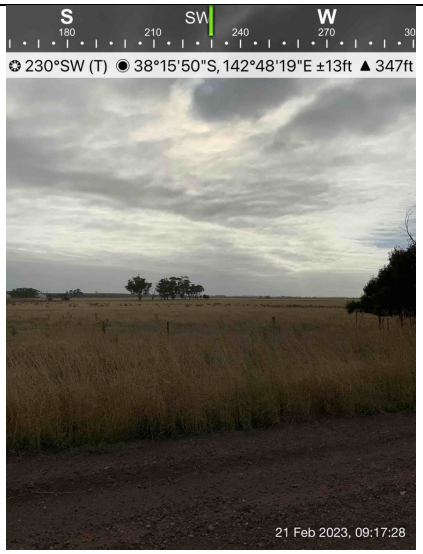
1 View from the intersection of Swanson Lane and Princes Highway.	
2 View from the intersection of Swanson Lane and Princes Highway.	
3 View from the intersection of Swanson Lane and Princes Highway.	

4 View from the intersection of Swanson Lane and Princes Highway. Typical roadside vegetation along Princes Highway with evidence of roadside management including slashing available.	 4
5 View from the intersection of Sisters-Garvoc Road and Princes Highway.	 1
6 View from the intersection of Sisters-Garvoc Road and Princes Highway.	

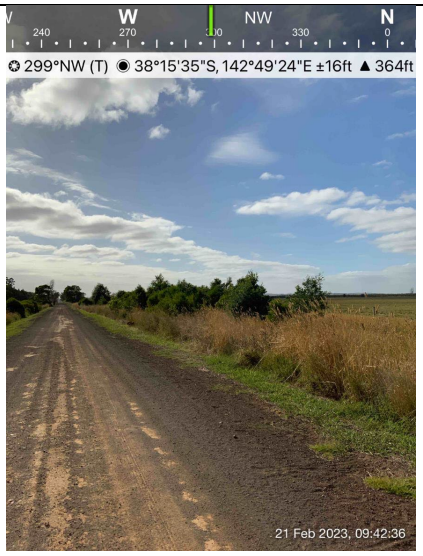
7 View from the intersection of Sisters-Garvoc Road and Princes Highway.	
8 View from the intersection of Sisters-Garvoc Road and Princes Highway.	
9 Typical vegetation on the eastern side of Sisters-Garvoc Road for approximately 2-3 kilometres. Appears to be as a result of a revegetation program.	

10 Regeneration occurring on the eastern side of Sisters-Garvoc Road and framing properties to the west.	
11 View to the north west from the north western corner of the development. The landscape is dominated by grassland associated with agricultural activities.	
12 Typical roadside vegetation along Sisters-Garvoc Road.	

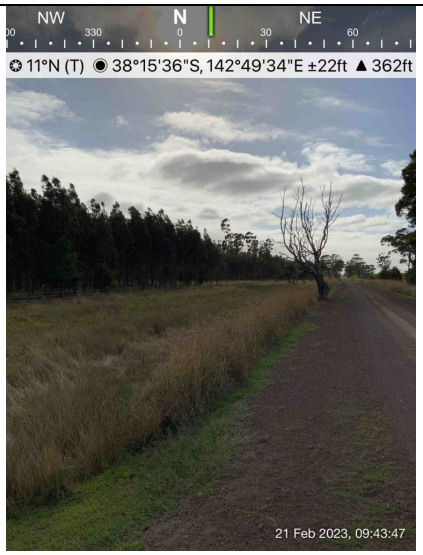
13 Sisters-Garvoc Road at the north western corner of the development.	
14 Looking southerly from Sisters-Garvoc Road.	
15 Typical vegetation along Sisters-Garvoc Road.	

16 Typical vegetation to the west of Sisters-Garvoc Road.	
17 Looking north westerly along Sisters-Garvoc Road.	
18 Agricultural land to the east of Sisters-Garvoc Road with the plantations to the north of Coyles Road in the background.	

19 Looking north towards the plantations from Sisters-Garvoc Road.	
20 plantations at the intersection of Sisters-Garvoc Road and Coyles Road.	
21 Vegetation at the intersection of Sisters-Garvoc Road and Coyles Road.	

22 Looking westerly from Coyles Road. The landscape is dominated by Agricultural properties.	
23 Typical landscape to the south of Coyles Road.	
24 Looking westerly along Coyles Road.	

25 Looking south westerly from Coyles Road.		
26 Typical vegetation in the surrounding landscape.		
27 plantations to the north of Coyles Road with a setback in place from the road.		

28 Typical landscape to the south of Coyles Road.	
29 plantations to the north of Coyles Road with evidence of a setback from the road.	
30 Typical landscape near WTG number 1.	

31 Typical landscape with the plantations to the east of the development in the background.	
32 Plantations to the east of the development.	
33 Typical landscape to the east of the development site.	

34 Typical landscape to the east of the development site.	
35 Typical landscape to the east of the development site.